

ICF-403S

SERVICE MANUAL

Ver 1.0 1999.08

*AEP Model
E Model
Australian Model*



SPECIFICATIONS

Frequency range:

Saudi Arabia model

FM	87.5-108 MHz
MW	526.5-1606.5 kHz
SW	5.95-18 MHz

AEP, Australian model

FM	87.5-108 MHz
MW	530-1605 kHz
SW	5.95-18 MHz

Speaker

Approx. 7.7 cm (3 inches) dia., 4 Ω

Output

Ⓜ (earphone) jack (minijack)

Power output

300 mW (at 10 % harmonic distortion)

Power requirements

4.5V DC, three R6 (size AA) batteries
4.5V DC, three LR6 (size AA) batteries
DC IN 4.5V jack accepts: Sony AC-E45HG AC power adaptor (not supplied)

Dimensions

Approx. 197 x 101 x 45 mm (w/h/d) ($7\frac{7}{8}$ x 4 x $1\frac{13}{16}$ inches) incl. projecting parts and controls

Mass

Approx. 465 g (16.4 oz) incl. batteries

Design and specifications are subject to change without notice.

FM/MW/SW 3 BAND RADIO



SONY®

TABLE OF CONTENTS

Specifications	1
1. GENERAL	
Location and Function of Controls	2
2. DISASSEMBLY	
2-1. Cabinet (Rear)	3
2-2. Cabinet (Front)	3
2-3. Main Board, Chassis	4
3. DIAL POINTER INSTALLATION	5
4. ELECTRICAL ADJUSTMENTS	6
5. DIAGRAMS	
5-1. Printed Wiring Boards	7
5-2. Schematic Diagram	9
6. EXPLODED VIEWS	11
7. ELECTRICAL PARTS LIST	13

Flexible Circuit Board Repairing

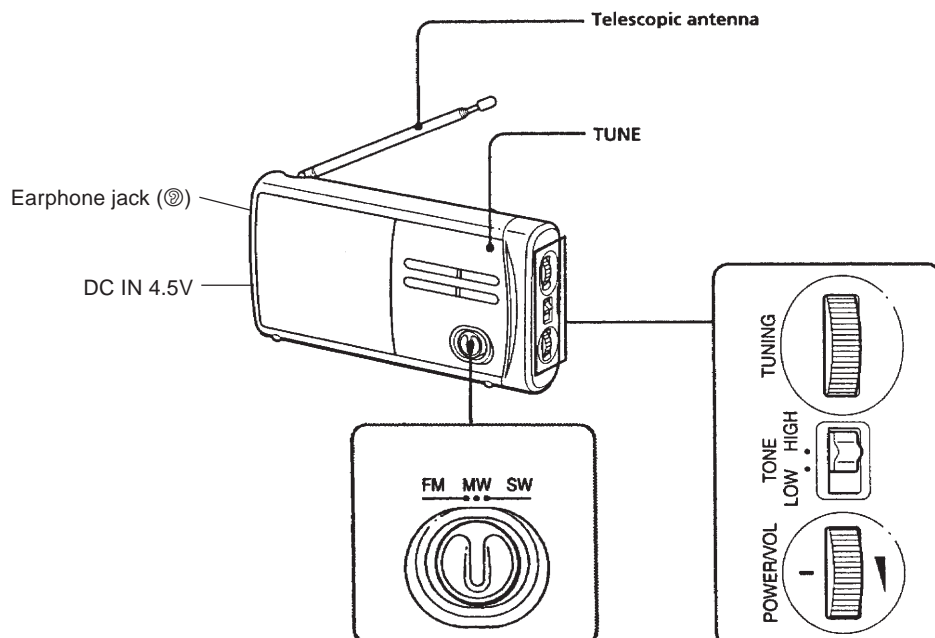
- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SECTION 1 GENERAL

LOCATION AND FUNCTION OF CONTROLS



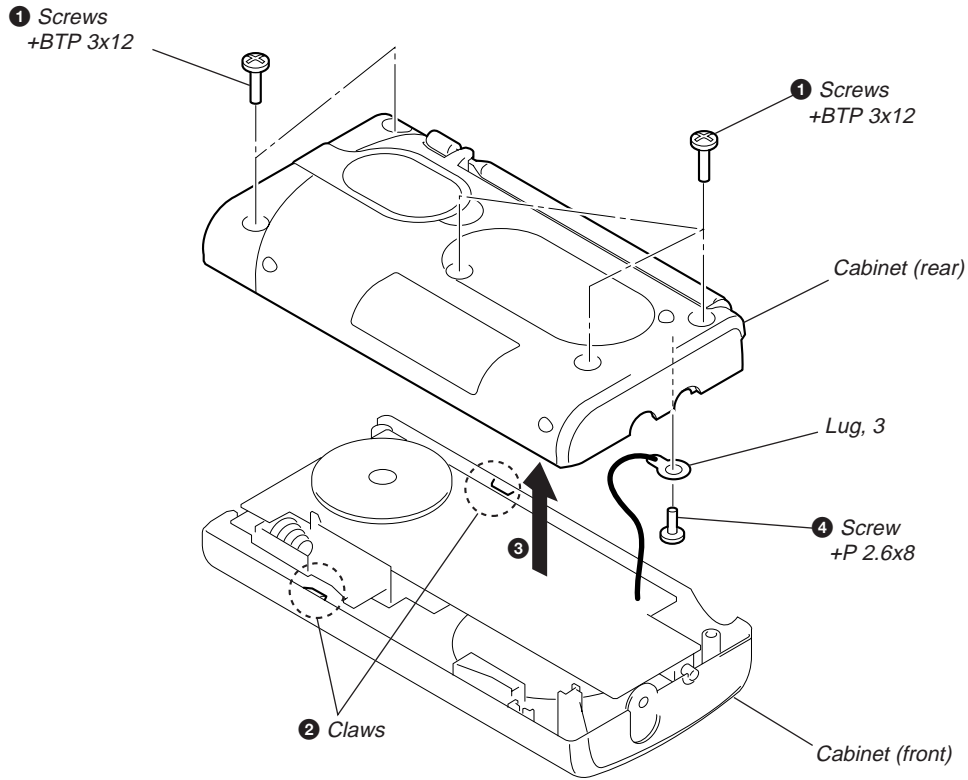
SECTION 2 DISASSEMBLY

● The equipment can be removed using the following procedure.

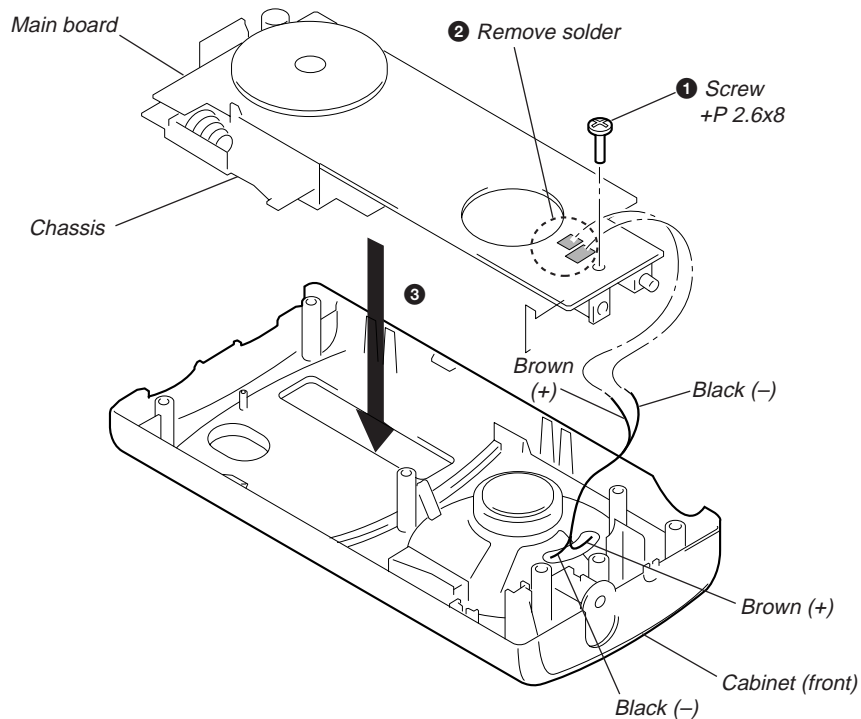
Set → Cabinet (Rear) → Cabinet (Front) → Main board, Chassis

Note : Follow the disassembly procedure in the numerical order given.

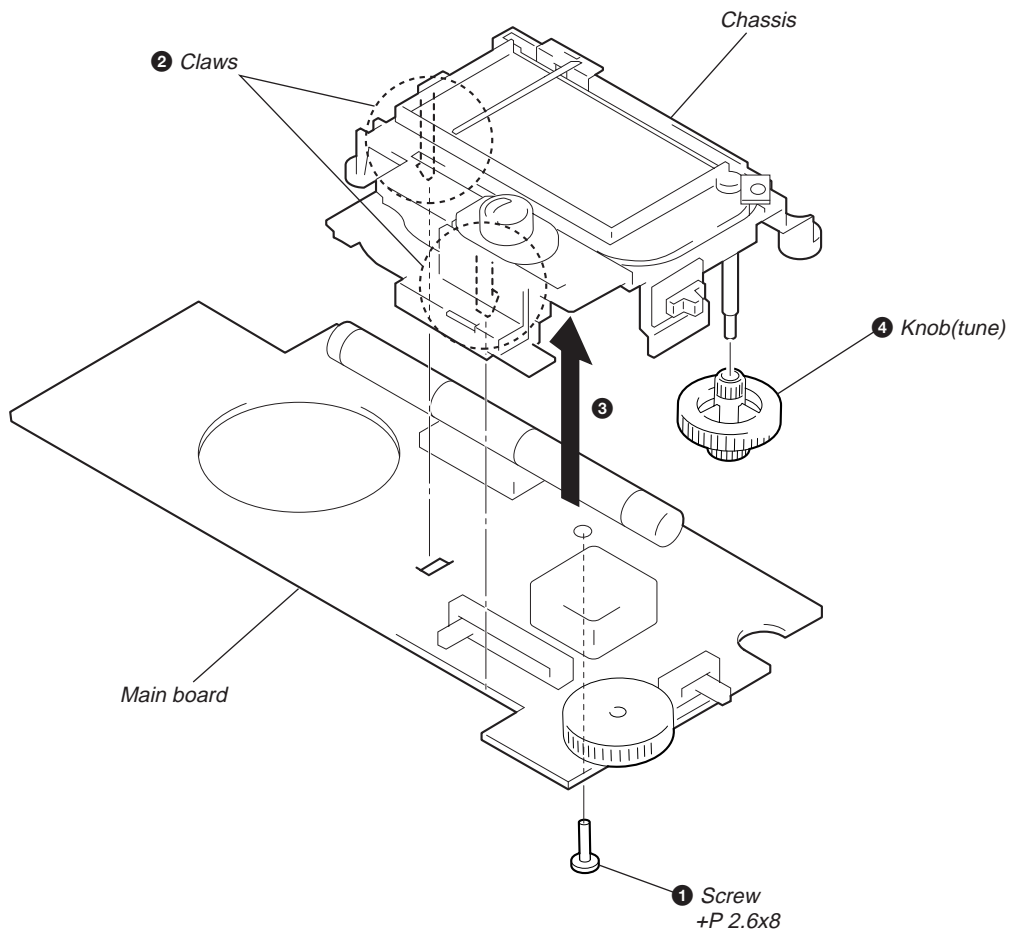
2-1. CABINET (REAR)



2-2. CABINET (FRONT)

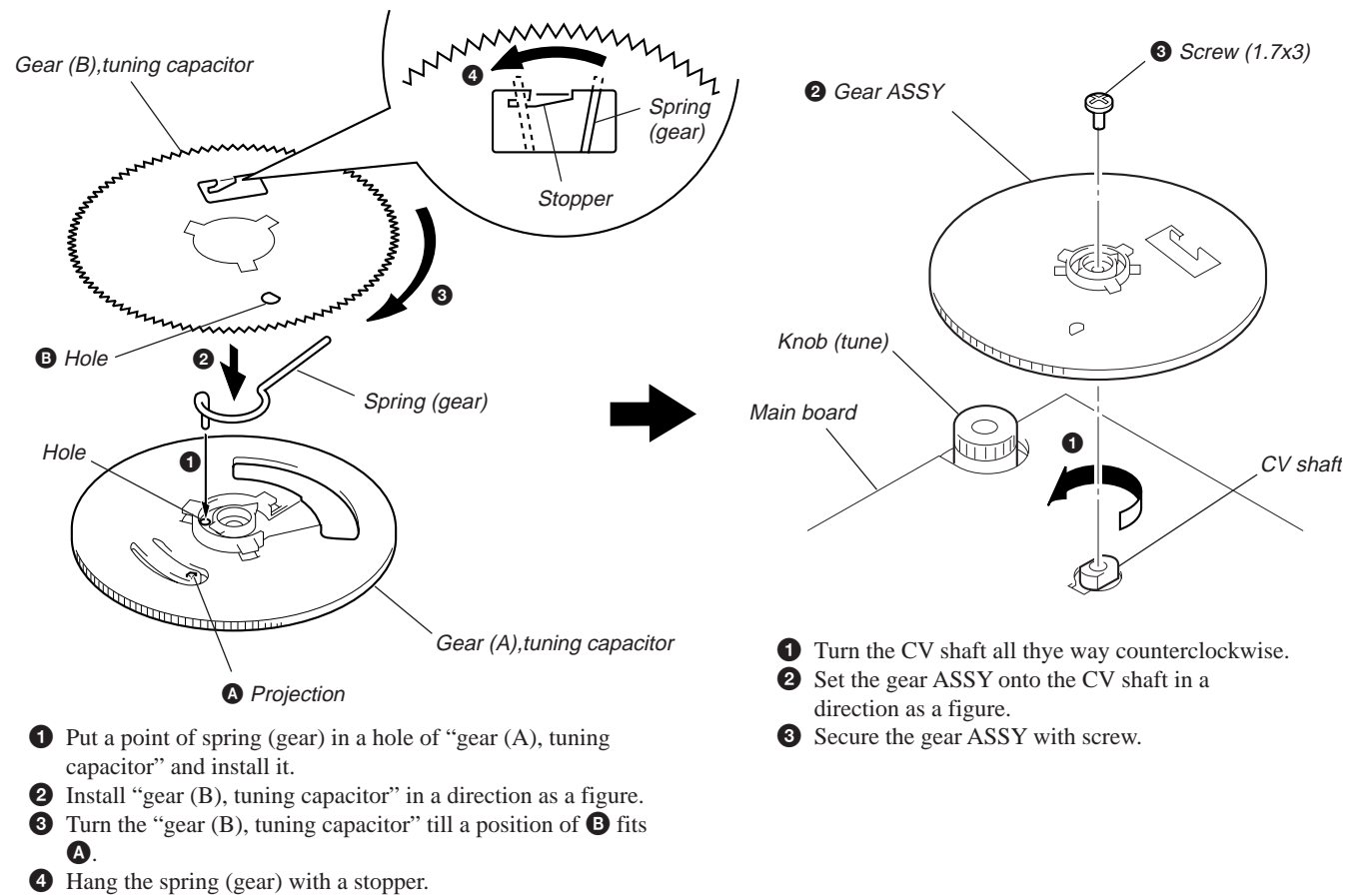
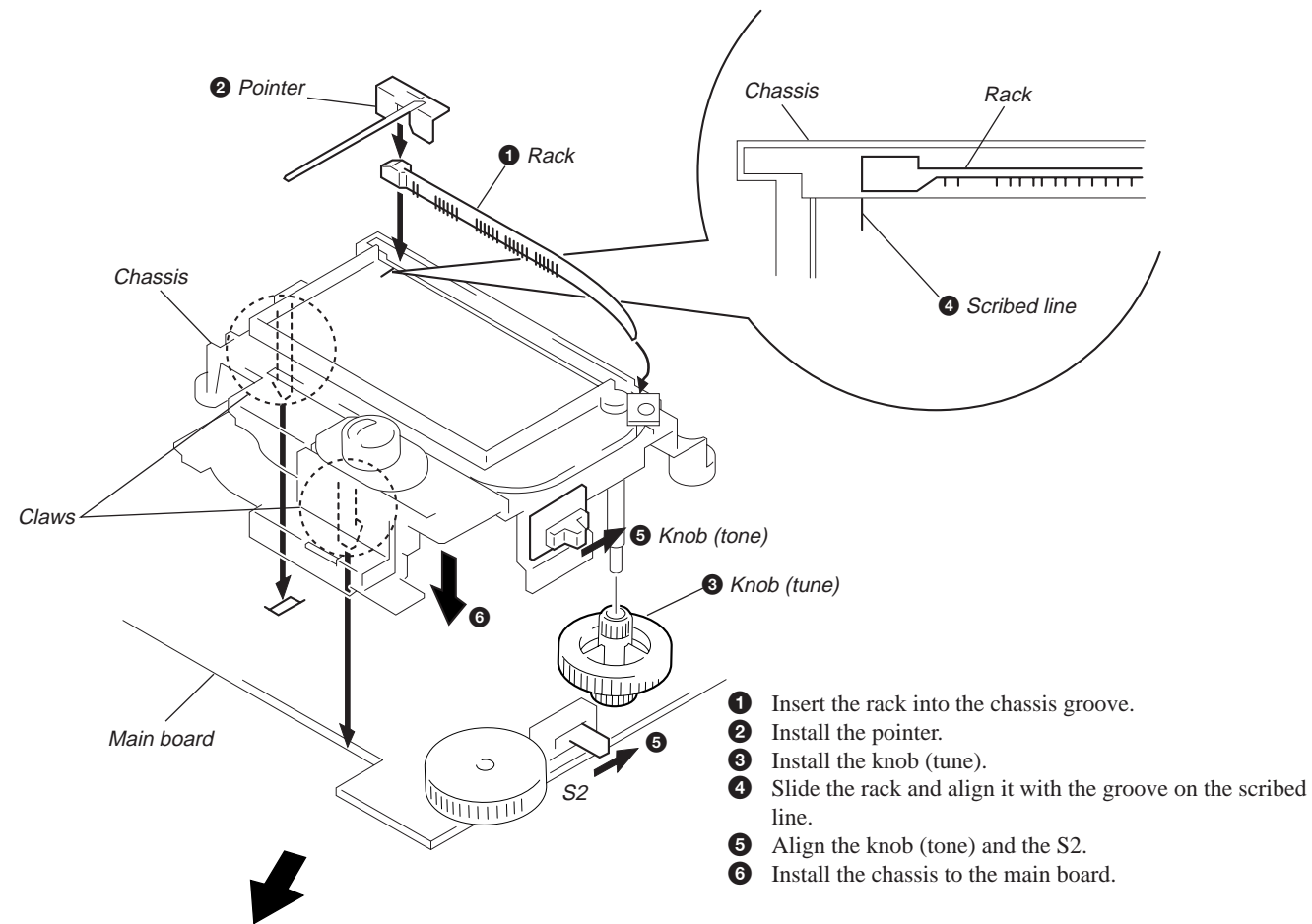


2-3. MAIN BOARD, CHASSIS



SECTION 3 DIAL POINTER INSTALLATION

Note : Follow the installation procedure in the numerical order given.



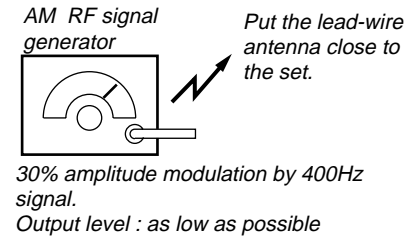
SECTION 4 ELECTRICAL ADJUSTMENTS

TUNER SECTION 0dB=1μV

MW Section

Procedure :

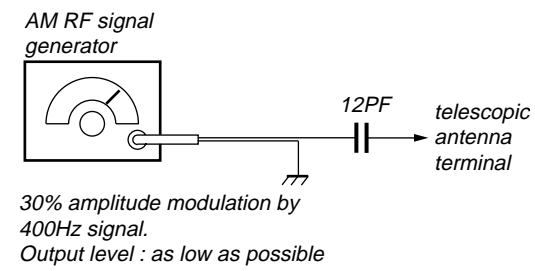
BAND : MW



SW Section

Procedure :

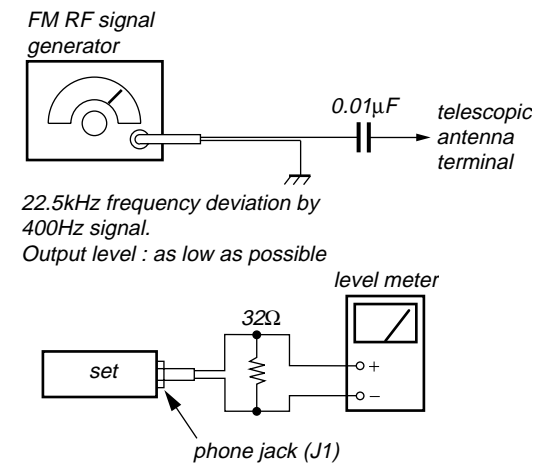
BAND : SW



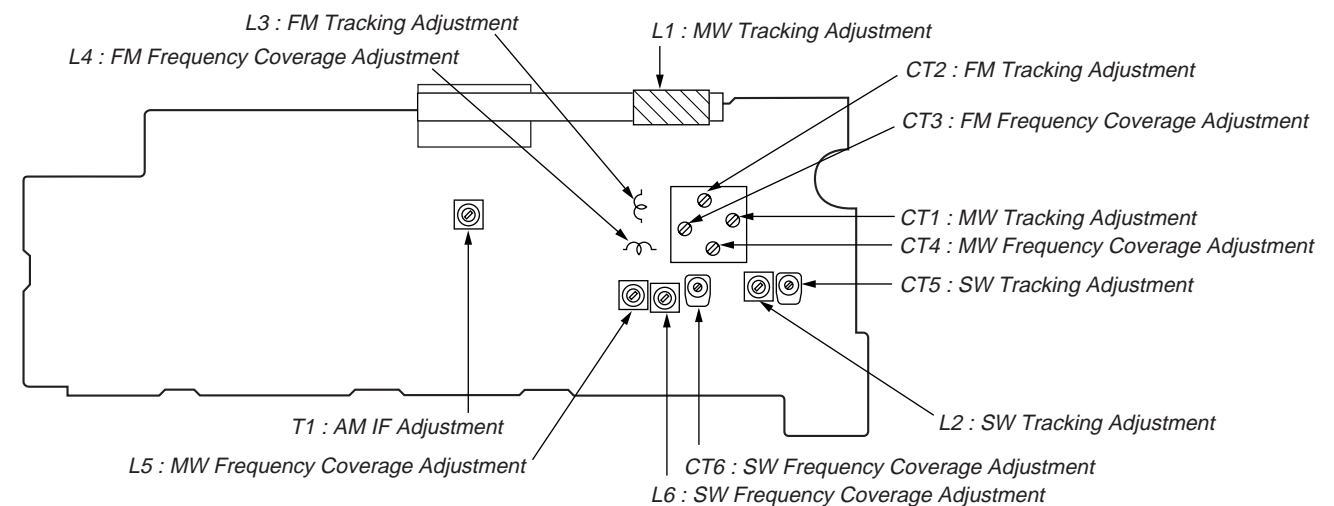
FM Section

Procedure :

BAND : FM



Adjustment Location : Main board (Component side)



• Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

< > : Saudi Arabia model

AM IF ADJUSTMENT	
Adjust for a maximum reading on level meter.	
T1	455kHz

MW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L5	520kHz
CT4	1,650kHz

MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L1	620kHz
CT1	1,400kHz

SW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L6	5.8MHz
CT6	18.5MHz

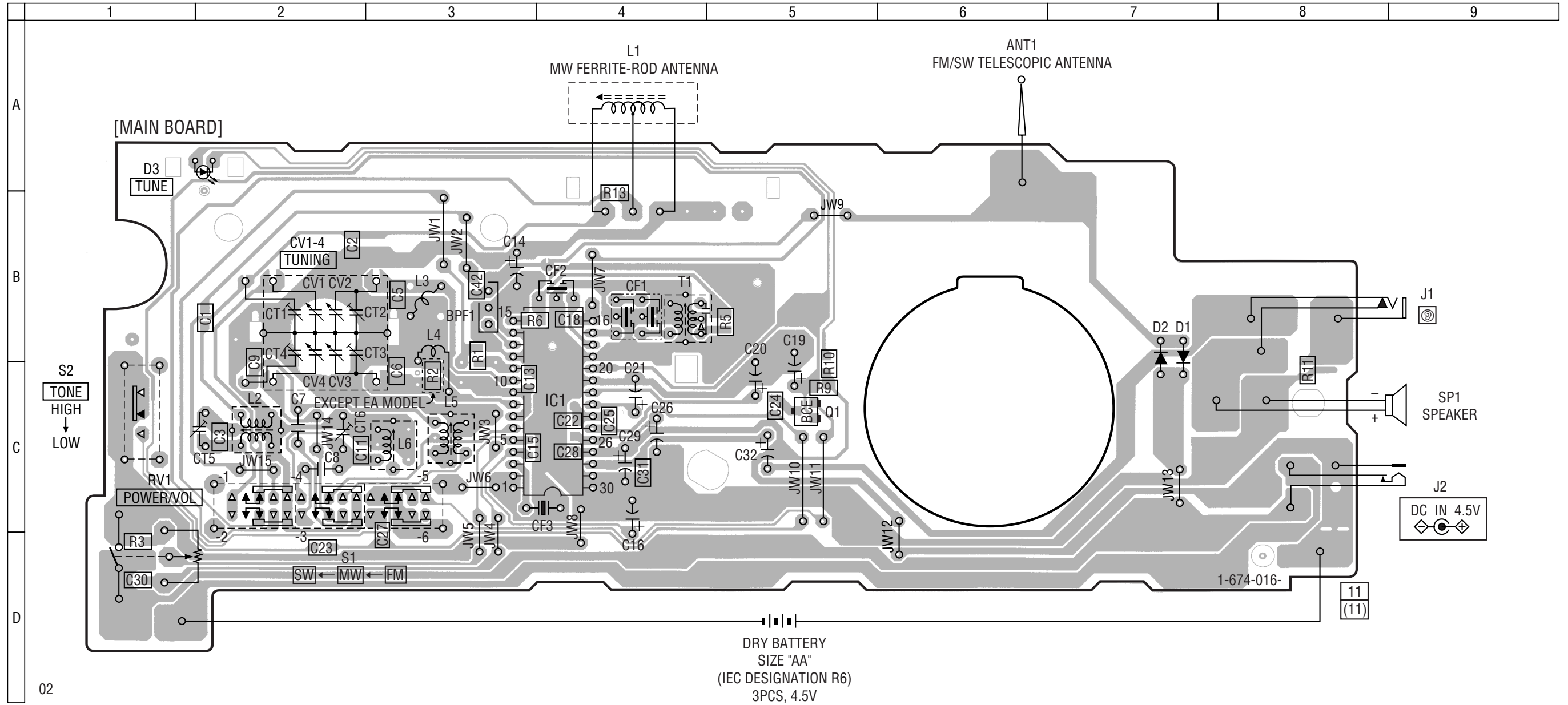
SW TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L2	5.8MHz
CT5	18.5MHz

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L4	86.5MHz <87.35MHz>
CT3	109.5MHz <108.25MHz>

FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L3	86.5MHz <87.35MHz>
CT2	109.5MHz <108.25MHz>

SECTION 5
DIAGRAMS

5-1. PRINTED WIRING BOARDS



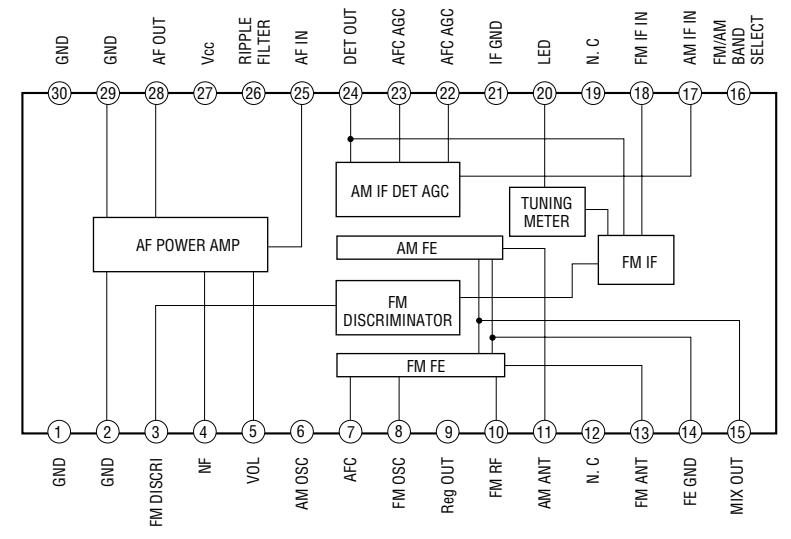
Semiconductor Location

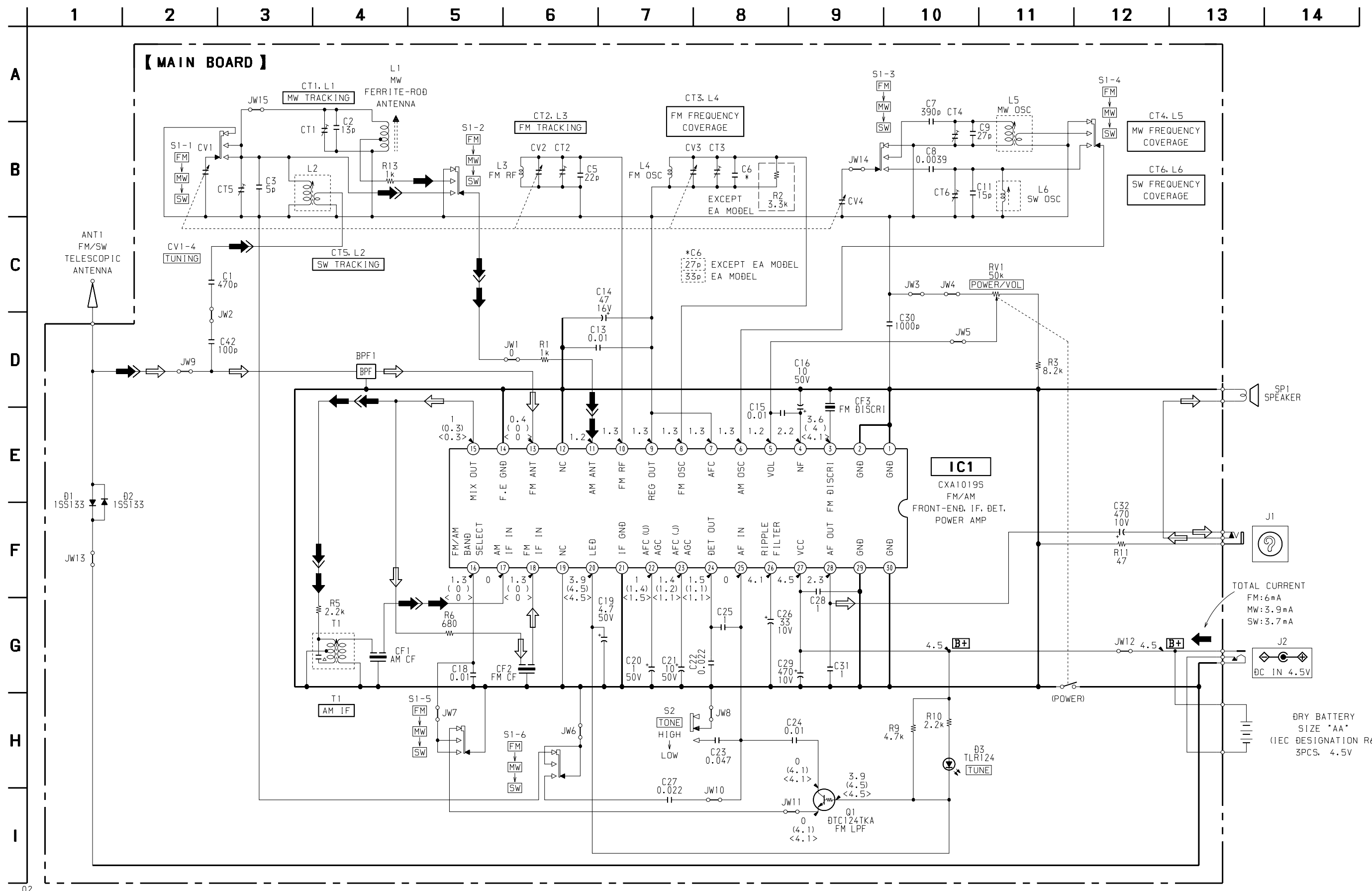
Ref. No.	Location
D1	B-7
D2	B-7
D3	A-2
IC1	C-4
Q1	C-5

Note:

- : parts extracted from the component side.
- △ : internal component.
- ▨ : Pattern from the side which enables seeing.
- Abbreviation
EA : Saudi Arabia

IC Block Diagram.
IC1 CXA1019S





Note:

- All capacitors are in μF unless otherwise noted. pF : μpF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
- Δ : internal component.
- B+** : B+ Line.
- : adjustment for repair.

- Power voltage is dc 4.5V and fed with regulated dc power supply from battery terminal (J2).
- Voltages are dc with respect to ground under no-signal (detuned) conditions.
- no mark : FM
- () : MW
- < > : SW

- Voltages are taken with a VOM (Input impedance 10 $\text{M}\Omega$). Voltage variations may be noted due to normal production tolerances.
- Signal path.
- \Rightarrow : FM \Rightarrow : MW \Rightarrow : SW
- Abbreviation
- EA : Saudi Arabia

TOTAL CURRENT
 FM: 6mA
 MW: 3.9mA
 SW: 3.7mA

J2
 DC IN 4.5V

DRY BATTERY
 SIZE "AA"
 (IEC DESIGNATION R6)
 3PCS. 4.5V

SECTION 6 EXPLODED VIEWS

NOTE :

- XX, -X mean standardized parts, so they may have some difference from the original one.

Color indication of Appearance Parts

Example :

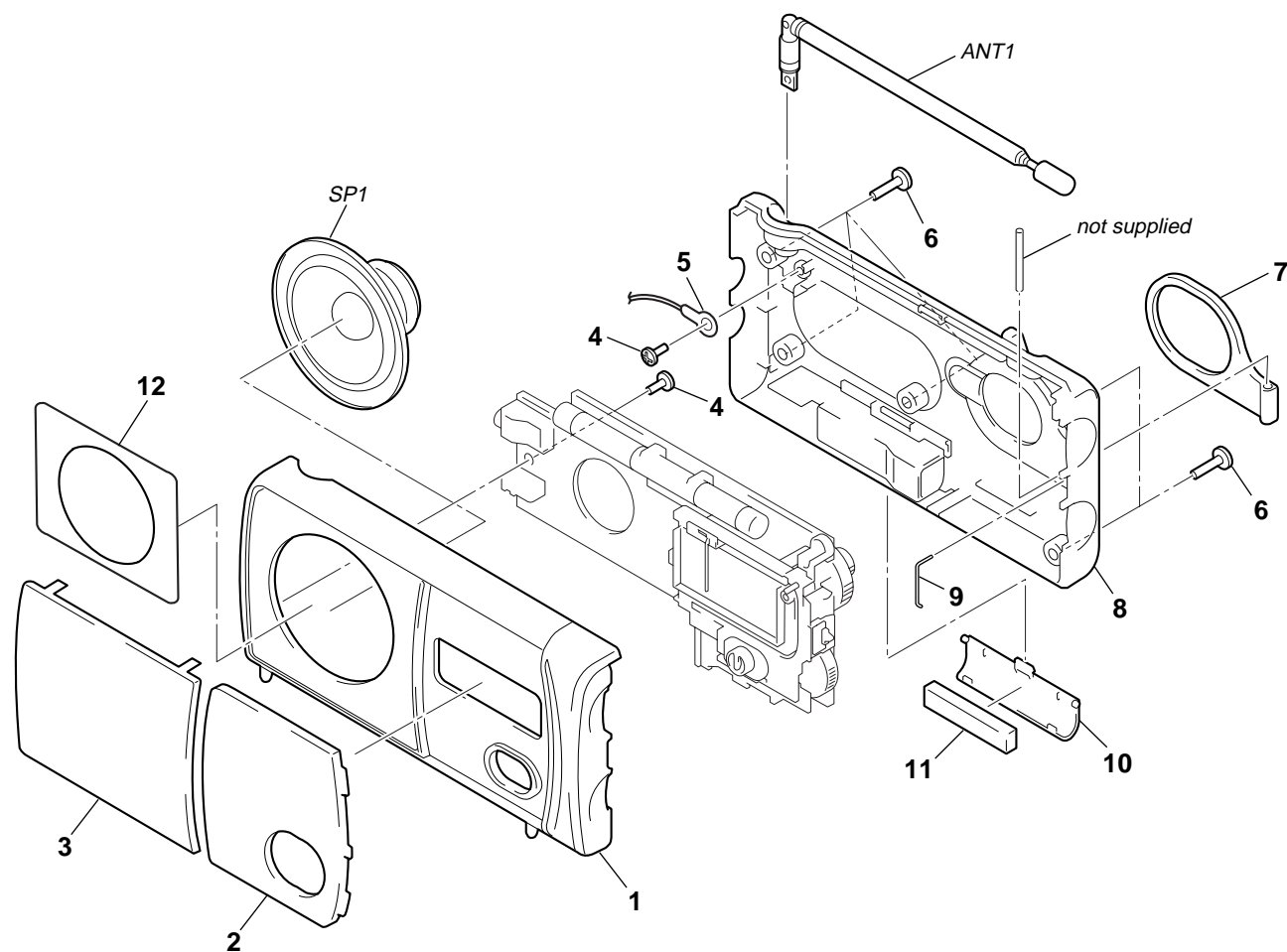
KNOB, BALANCE (WHITE) ••• (RED)

↑ ↑
Parts color Cabinet's color

- Items marked “ * ” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

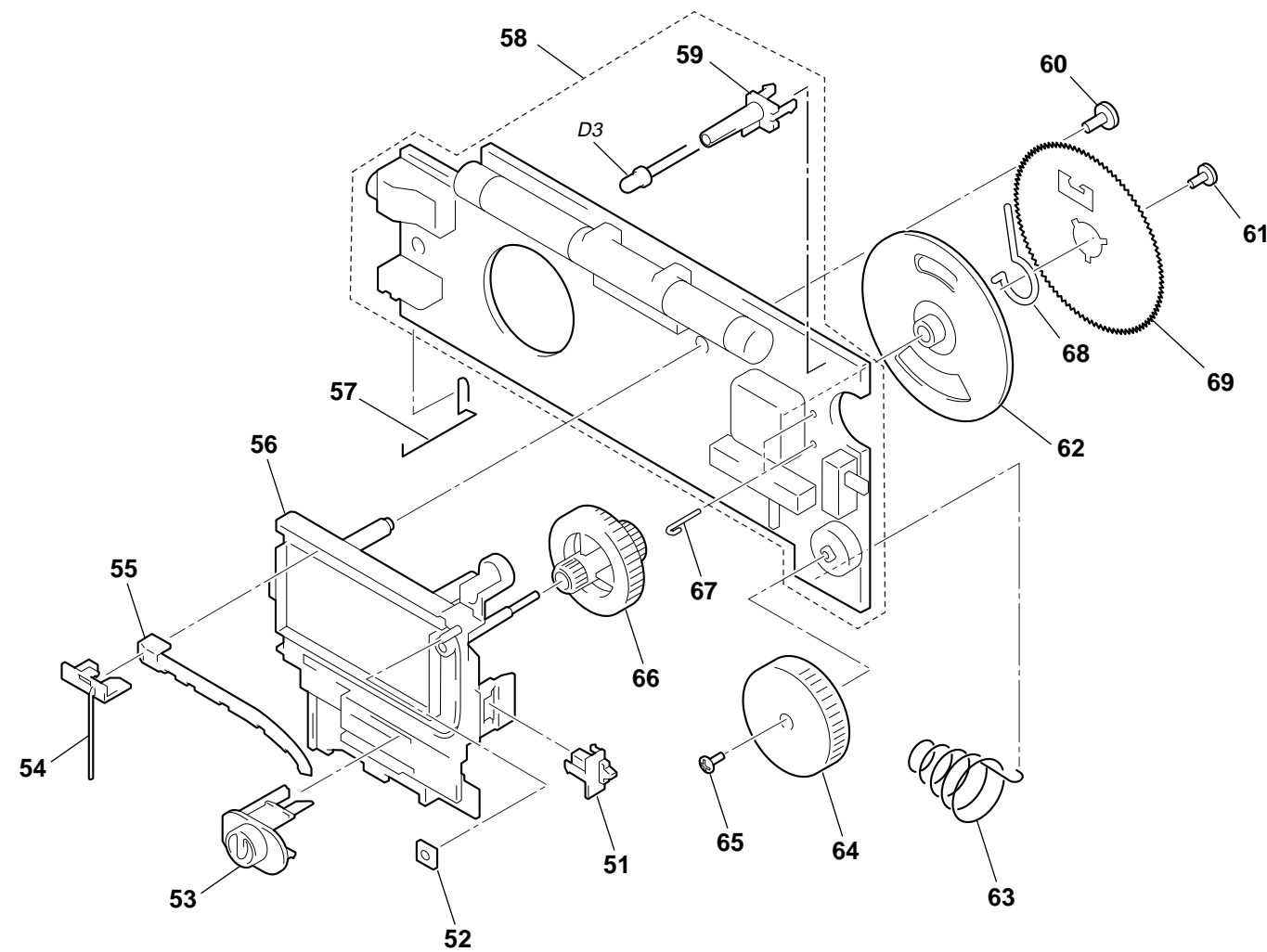
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
EA : Saudi Arabia

6-1. CABINET SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	3-037-016-01	CABINET (FRONT) (BLACK)		7	3-037-024-11	HANDLE (WHITE) (AEP)	
1	3-037-016-11	CABINET (FRONT) (WHITE) (AEP)		8	3-037-017-01	CABINET (REAR) (BLACK)	
2	3-037-026-01	PLATE, TRANSPARENT (EXCEPT EA)		8	3-037-017-11	CABINET (REAR) (WHITE) (AEP)	
2	3-037-026-11	PLATE, TRANSPARENT (EA)		9	3-037-034-01	SPRING (HANDLE)	
3	3-037-029-01	PANEL(SPEAKER) (BLACK)		10	3-037-019-01	LID,BATTERY CASE (BLACK)	
3	3-037-029-11	PANEL(SPEAKER) (WHITE) (AEP)		10	3-037-019-11	LID,BATTERY CASE (WHITE) (AEP)	
4	7-685-134-19	SCREW+P 2.6X8 TYPE2 NON-SLIT		11	3-372-124-01	CUSHION (BATTERY)	
5	7-623-508-01	LUG,3		12	3-040-489-01	SHEET, SPEAKER	
6	7-685-548-14	SCREW +BTP 3X12 TYPE2 N-S		ANT1	1-501-222-81	ANTENNA, TELESCOPIC (FM, SW)	
7	3-037-024-01	HANDLE (BLACK)		SP1	1-529-451-11	SPEAKER (7.7cm)	

6-2. CHASSIS SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	3-037-023-01	KNOB(TONE) (BLACK)		61	3-364-941-11	SCREW (+B) (2.6X5), NYLOK	
51	3-037-023-11	KNOB(TONE) (WHITE) (AEP)		62	3-037-027-01	GEAR(A), TUNING CAPACITOR	
* 52	1-674-032-11	RACK RETAINER BOARD		63	3-037-031-01	TERMINAL (-), BATTERY	
53	3-037-021-01	KNOB(BAND) (BLACK)		64	3-037-020-01	KNOB(VOL) (BLACK)	
53	3-037-021-11	KNOB(BAND) (WHITE) (AEP)		64	3-037-020-11	KNOB(VOL) (WHITE) (AEP)	
54	3-037-025-01	POINTER		65	3-880-990-00	SCREW (1.7X3),FLAT,(+) SPECIAL	
55	3-369-170-01	RACK		66	3-037-022-01	KNOB(TUNE) (BLACK)	
* 56	3-037-018-01	CHASSIS		66	3-037-022-11	KNOB(TUNE) (WHITE) (AEP)	
57	3-037-030-01	TERMINAL (+), BATTERY		67	3-037-523-01	PIN(TUNING CAPACITOR)	
* 58	A-3663-363-A	MAIN BOARD, COMPLETE (EXCEPT EA)		68	3-037-033-01	SPRING (GEAR)	
* 58	A-3663-380-A	MAIN BOARD, COMPLETE (EA)		69	3-037-032-01	GEAR(B), TUNING CAPACITOR	
59	3-037-028-01	HOLDER, LED		D3	8-719-069-94	LED TLR124 (TUNE)	
60	7-685-134-19	SCREW +P 2.6X8 TYPE2 NON-SLIT					

SECTION 7 ELECTRICAL PARTS LIST

MAIN

NOTE :

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms
METAL : Metal-film resistor
METAL OXIDE :Metal oxide-film resistor
F : nonflammable
- Items marked “ * ” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- SEMICONDUCTORS
In each case, u : μ , for example :
uA.... : μ A.... , uPA.... : μ PA....
uPB.... : μ PB.... , uPC.... : μ PC....
uPD.... : μ PD....
- CAPACITORS
uF : μ F
- COILS
uH : μ H
- Abbreviation
EA : Saudi Arabia

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	A-3663-363-A	MAIN BOARD, COMPLETE (EXCEPT EA)		C28	1-164-346-11	CERAMIC CHIP 1uF	16V
*	A-3663-380-A	MAIN BOARD, COMPLETE (EA)		C29	1-126-925-11	ELECT 470uF	20% 10V
		*****		C30	1-163-009-11	CERAMIC CHIP 0.001uF	10% 50V
	3-037-020-01	KNOB (VOL) (BLACK)		C31	1-164-346-11	CERAMIC CHIP 1uF	16V
	3-037-020-11	KNOB (VOL) (WHITE) (AEP)		C32	1-126-925-11	ELECT 470uF	20% 10V
	3-037-027-01	GEAR (A), TUNING CAPACITOR		C42	1-163-251-11	CERAMIC CHIP 100PF	5% 50V
	3-037-028-01	HOLDER, LED				< FILTER >	
	3-037-032-01	GEAR (B), TUNING CAPACITOR		CF1	1-567-670-11	FILTER, CERAMIC	
	3-037-033-01	SPRING (GEAR)		CF2	1-577-588-11	FILTER, CERAMIC	
	3-037-523-01	PIN (TUNING CAPACITOR)		CF3	1-577-573-11	FILTER, CERAMIC	
	3-364-941-11	SCREW (+B) (2.6X5), NYLOK				< TRIMMER >	
	3-880-990-00	SCREW (1.7X3),FLAT,(+) SPECIAL		CT1	1-141-612-11	CAP, VER (MW TRACKING)	
		< FILTER >		CT2	1-141-612-11	CAP, VER (FM TRACKING)	
BPF1	1-236-839-11	FILTER, BAND PASS		CT3	1-141-612-11	CAP, VER (FM FREQUENCY COVERAGE)	
		< CAPACITOR >		CT4	1-141-612-11	CAP, VER (MW FREQUENCY COVERAGE)	
C1	1-163-133-00	CERAMIC CHIP 470PF	5% 50V	CT5	1-141-601-21	CAP, ADJ (SW TRACKING)	
C2	1-163-096-00	CERAMIC CHIP 13PF	5% 50V	CT6	1-141-601-21	CAP, ADJ (SW FREQUENCY COVERAGE)	
C3	1-163-222-11	CERAMIC CHIP 5PF	0.25PF 50V			< VARIABLE CAPACITOR >	
C5	1-163-235-11	CERAMIC CHIP 22PF	5% 50V	CV1	1-141-612-11	CAP, VER (TUNING)	
C6	1-163-103-00	CERAMIC CHIP 27PF	5% 50V	CV2	1-141-612-11	CAP, VER (TUNING)	
		(EXCEPT EA)		CV3	1-141-612-11	CAP, VER (TUNING)	
C6	1-163-105-00	CERAMIC CHIP 33PF	5% 50V	CV4	1-141-612-11	CAP, VER (TUNING)	
		(EA)				< DIODE >	
C7	1-104-732-11	FILM 390PF	5% 100V	D1	8-719-991-33	DIODE 1SS133T-77	
C8	1-136-682-11	FILM 0.0039uF	5% 100V	D2	8-719-991-33	DIODE 1SS133T-77	
C9	1-163-103-00	CERAMIC CHIP 27PF	5% 50V	D3	8-719-069-94	LED TLR124 (TUNE)	
C11	1-163-097-00	CERAMIC CHIP 15PF	5% 50V			< IC >	
C13	1-163-021-91	CERAMIC CHIP 0.01uF	10% 50V	IC1	8-752-037-02	IC CXA1019S	
C14	1-124-589-11	ELECT 47uF	20% 16V			< JACK >	
C15	1-163-031-11	CERAMIC CHIP 0.01uF	50V	J1	1-770-666-11	JACK (⊙)	
C16	1-126-964-11	ELECT 10uF	20% 50V	J2	1-580-681-21	JACK,DC(POLARITY UNIFIED TYPE)	(DC IN 4.5V)
C18	1-163-031-11	CERAMIC CHIP 0.01uF	50V			< COIL >	
C19	1-126-963-11	ELECT 4.7uF	20% 50V	L1	1-402-568-31	ANTENNA, FERRITE-ROD (MW)	(MW TRACKING)
C20	1-126-960-11	ELECT 1uF	20% 50V				
C21	1-126-964-11	ELECT 10uF	20% 50V				
C22	1-163-037-11	CERAMIC CHIP 0.022uF	10% 25V				
C23	1-163-035-00	CERAMIC CHIP 0.047uF	50V				
C24	1-163-021-91	CERAMIC CHIP 0.01uF	10% 50V				
C25	1-164-346-11	CERAMIC CHIP 1uF	16V				
C26	1-126-966-11	ELECT 33uF	20% 16V				
C27	1-163-033-91	CERAMIC CHIP 0.022uF	50V				

MAIN

Ref. No.	Part No.	Description	Remark
L2	1-424-529-21	COIL (SW TRACKING)	
* L3	1-422-320-11	COIL, AIR-CORE (FM TRACKING)	
L4	1-422-131-00	COIL, FM OSCILLATION (FM FREQUENCY COVERAGE) (EXCEPT EA)	
L4	1-459-954-21	COIL (WITH CORE) (FM FREQUENCY COVERAGE) (EA)	
L5	1-406-092-31	COIL, OSC (MW) (MW FREQUENCY COVERAGE)	
L6	1-406-093-31	COIL, OSC (SW) (SW FREQUENCY COVERAGE)	
< TRANSISTOR >			
Q1	8-729-027-53	TRANSISTOR DTC124TKA-T146	
< RESISTOR >			
R1	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R2	1-216-061-00	METAL CHIP 3.3K 5% 1/10W (EXCEPT EA)	
R3	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R5	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R6	1-216-045-00	METAL CHIP 680 5% 1/10W	
R9	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	
R10	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R11	1-216-017-91	RES,CHIP 47 5% 1/10W	
R13	1-216-049-91	RES,CHIP 1K 5% 1/10W	
< VARIABLE RESISTOR >			
RV1	1-241-555-11	RES, VAR, CARBON 50K (POWER/VOL)	
< SWITCH >			
S1	1-771-748-11	SWITCH, SLIDE (FM, MW, SW)	
S2	1-552-370-00	SWITCH, SLIDE (TONE)	
< TRANSFORMER >			
T1	1-404-790-11	TRANSFORMER, IF (AM IF)	

MISCELLANEOUS *****			
* 52	1-674-032-11	RACK RETAINER BOARD	
ANT1	1-501-222-81	ANTENNA, TELESCOPIC (FM, SW)	
D3	8-719-069-94	LEDTLR124 (TUNE)	
SP1	1-529-451-11	SPEAKER (7.7cm)	

ACCESSORIES & PACKING MATERIALS *****			
3-867-127-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, GERMAN, SPANISH, DUTCH, ITALIAN, PORTUGUESE) (AEP)		
3-867-127-21	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, POLISH, HUNGARIAN, RUSSIAN, CHINESE, ARABIC) (7AEP,AUS,EA)		